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ABSTRACT

This study investigate the factor structure of the Nowicki-Strickland locus of control scales for children. A major objective of the research was to provide empirical evidence that can help to reveal the multi-dimensionality (or uni-dimensionality) of locus of control. This is an important distinction because locus of control will be a superior predictor of behavior if it is multi-(as opposed to uni-) dimensional. Responses of 449 elementary school children, 388 junior high students, and 389 high school students to the Nowicki-Strickland scales were factor analyzed. Results indicated that there was a general factor (dealing with feelings of helplessness) across all ages. However, other factors were not nearly as general across ages. The differential factors may also be sex related at different age levels. It was hypothesized that the differential factors may reveal important developmental tasks relevant at each age level. Results are discussed with regard to their implications for locus of control of scales in general, and differential scoring and creation of subtests to reflect these factors are suggested as logical next steps. (DP)

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FACTOR STRUCTURE OF LOCUS OF CONTROL IN CHILDREN[1]

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I am going to talk to you about the factor structure of the Nowicki-Strickland locus of control scale for children at three different age levels. The three levels were chosen to reflect three general developmental stages known in education as the elementary, junior high school and high school ages.

I have been impressed by recent research which suggests that locus of control as measured by present assessment instruments is multidimensional and not unidimensional as is usually theoretically assumed. If indeed locus of control as assessed by our present instruments is multidimensional then this information should be most helpful in making finer predictions of behavior. If true it also suggests that these additional dimensions of locus of control should be identified and related to appropriate behaviors. Here the work of the Gurins, and Hanna Levenson is exemplary. They have identified factors and constructed scales to reflect these factors and have now begun to relate these factor scale scores to behavior. However, (and I make this point early in my presentation because I feel it is of crucial importance to all factor data reported) the criterion researchers in this area should use is the significant increase in predicting behavior from a breakdown of locus of control into its finer components relative to

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[1]A paper presented at the American Psychological Association meeting

predicting behavior from a global measure. And although I am drawn to the logical soundness of the multidimensional approach to predicting behavior, its empirical verification and support has yet to be presented. Now back to the present study.

Most of the work involving factor analysis of locus of control scales has used late adolescent or adult subjects. Little research of the factor analysis type has been done using children. Why this should be is surprising for the investigation of LOC in children is of tremendous importance. The closest work to factor analysis is Crandall's work at Fels. In constructing the Intellectual Achievement Responsibility scale (IAR), there seems to have been an "intuitive factor analysis" in which it is assumed that a locus of control of achievement behaviors is a better predictor of academic achievement performance, than is a more global measure of locus of control. Again, although the logic of this approach is compelling, the empirical evidence that this scale predicts academic achievement behaviors better than a global locus of control scale is relatively lacking. In fact, in at least one instance (including 1000 children) comparison of the IAR measure with a more global measure of LOC has shown no difference between the two in predicting academic achievement (Roberts, 1971).

In any case, factor analytic work has not been as popular with children's scales as it has with adult scales. It seems logical though, that if locus of control is not unidimensional then the multidimensional factor structure of the locus of control might be different between children and adults and perhaps among different aged children. And if locus of control scales are reflecting different factor structures at different ages then it would make some sense to assume that these different components would predict relevant behavior differentially depending on the age of the child.

To investigate the factor structure of locus of control in children, the responses of subjects at the elementary (grades 3 through 6; males = 216, females = 233) junior high school (grades 7 through 9; males = 186, females = 202) and high school (grades 10 - 12; males = 202, females = 187) to the Nowicki-Strickland locus of control scale were used.

The Nowicki-Strickland Locus of Control scale is a paper and pencil measure consisting of 40 questions which are answered either yes or no by placing a mark next to the question. This form of the measure derived from work which began with a large number of items (N = 102) constructed on the basis of Rotter's definition of the internal-external control of reinforcement dimension. The items described reinforcement situations across interpersonal and motivational areas such as affiliation, achievement, and dependency. School teachers were consulted in the construction of items. The goal was to make the items readable at the fifth grade level yet appropriate for older students. Examples of items are, "Do you feel that if things start out well in the morning, it's going to be a good day no matter what you do?" and "Can you stop yourself from catching a cold?"

Responses to the 40 items were intercorrelated and the resulting matrix factored by the principal components method with a minimum eigen-value of .8 for computation of components. Squared multiple correlations were entered in the diagonal and the components rotated to orthogonal simple structure by means of Kaiser's (1958) Varimax method. The minimum eigenvalue for factor rotation was 1.0. Separate analyses were performed for males and females at each age level.

Results of the factor analysis indicated a general factor which was consistent across all ages. It accounted for 36% of the variance at the elementary level; 38% at the junior high school level and 41% of variance

at the high school level. Items loading high on Factor 1 concern a general feeling of Helplessness and failure to control or direct things occurring around the person. For example, "Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway" and "Do you feel that when you do something wrong there is very little you can do to make it right?" Eight items loaded in on this factor. However, factors two and three were not as general across age (they accounted for from 8% to 19% of the variance) and the factor structure suggests strongly that these secondary factors are age specific and perhaps reveal the important developmental tasks relevant for each age level.

For example, Factor 2 for male and female elementary children has items dealing with achievement and strength. However at the junior high level, Factor 2 involves some items dealing with achievement but also has a greater number of items reflecting getting things one wants by persistence, work, and planning. At the high school level there is a dramatic difference in items loading on Factor 2. For males, there are a number of items relating to persistence to overcome luck or powerful others, whereas for females there are items related to an acceptance that fate, chance and/or powerful others govern things.

Factor three showed somewhat the same age specificity as well as a general component across age. The general component composed of items referring to luck. At the elementary level this factor had, in addition to the luck component items relating to a deference to parents for males and with an item relating to ability to manipulate others for females. At the junior high level, items relating to persistence and success in social areas are found along with the items relating to luck. In high school the luck factor is coupled with items related to uses of fantasy as a defense for feelings of powerlessness.

The overlap of these loadings on the factor is modest and suggests differential scoring and the setting up of subtests to reflect these factors is the logical next step. As I mentioned earlier this is the crucial procedure upon which to base our judgement of the efficiency of such a procedure. This work is now underway. Rescoring of the CNSIE has been done on the basis of the results of this factor analysis. These factor scores will then be related to such relevant variables as academic achievement, teacher ratings of adjustment, popularity and the like. Next these relations will be compared to those found using a global measure. Only in this comparative manner can the utility of this approach be tested.

One final comment and then I'll close. This factor analysis indicates that although there is a general factor of locus of control there are also differential factors, which may be sex related on different age levels. If this be the case it may explain the inconsistent prediction of female behavior at each age level. It also suggests that locus of control scales should be constructed so as to yield both a general score and specific scale scores which would allow a researcher to choose the appropriate measure of locus of control orientation for his purposes. Locus of control measures used in this manner would be more efficient and could lead to more satisfactory testing of theoretical hypotheses.

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